

SPECIFIC MEMORANDUM OF AGREEMENT
BETWEEN
THE UNITED STATES DEPARTMENT OF ENERGY
AND
THE POWER REACTOR AND NUCLEAR FUEL DEVELOPMENT CORPORATION OF
JAPAN
IN A JOINT PROGRAM OF REACTOR SHIELDING RESEARCH

Whereas the United States Department of Energy (DOE) and the Power Reactor and Nuclear Fuel Development Corporation (PNC) of Japan (hereinafter referred to as "the Parties"), have agreed to cooperate under the Agreement Between the United States Department of Energy and the Power Reactor and Nuclear Fuel Development Corporation of Japan in the field of Liquid Metal Cooled Fast Breeder Reactors of January 31, 1979 (hereinafter referred to as "the LMFBF Agreement");

Whereas the Parties recognize the merits of collaboration to avoid unnecessary duplication of effort and to make best use of each country's resources to advance the development of fast reactors; and

Whereas the Parties wish to implement cooperation under the LMFBF Agreement in the Japanese-American Reactor Shielding Research Program (hereinafter referred to as the "JASPER Program"),

DOE and PNC agree as follows:

ARTICLE I

Objective

The objective of this Specific Memorandum of Agreement is to establish a joint program of reactor shielding measurements using the Tower Shielding Facility (TSF) at the Oak Ridge National Laboratory (ORNL) to investigate the properties and behavior of materials, materials systems and fast reactor components to neutron radiation and other associated effects in fast reactors.

ARTICLE II

Program

1. The Tower Shielding Facility houses a specially designed nuclear reactor radiation source and associated instrumentation which shall be utilized by ORNL for the conduct of shielding measurements prescribed by the joint program.

2. The joint program between DOE and PNC shall include the following series of experiments, hereinafter referred to as "the JASPER Program":

a. A Penetration Experiment to investigate neutron penetration through benchmark and representative mockups of the radial shield designs for advanced liquid-metal-cooled reactor concepts.

b. A Gap Streaming Experiment to investigate neutron and gamma-ray streaming in planar and annular gaps which are representative of inter-component spacings in the enclosure system of liquid-metal cooled reactors.

c. A Fission Gas Plenum Experiment to determine neutron streaming effects in the fission gas plenum region of fuel assemblies typical of Liquid Metal Fast Breeder Reactors (LMFBR).

d. An Axial Shield Experiment to investigate the effectiveness of axial shield designs for advanced LMFBRs using representative mockups of several design alternatives.

e. An In-Vessel Fuel Storage and Transfer Experiment to determine source multiplication and three-dimensional (3-D) effects of in-vessel stored fuel.

f. Secondary Sodium Activation Experiments to study activation rate distributions in IHX/DRACS (Intermediate Heat Exchangers/Decay-heat Removal Auxiliary Coolant System) mockups.

g. A 3-D Radiation Transport Benchmark Experiment to verify the accuracy of coupled two-dimensional and 3-D methods used in reactor shielding design analyses.

3. The JASPER Program is to run continuously for three years. However, if it should become necessary for DOE to interrupt the JASPER Program for the conduct of other measurements at the TSF, six months written notice shall be given to PNC and the JASPER Program shall be automatically extended by the period of interruption. Such interruptions shall not total more than one year.

4. DOE shall plan, conduct and analyze the JASPER Program. At all times DOE shall be in sole control of the execution of the JASPER Program and the Tower Shielding Facility. PNC shall participate in such planning, conduct and analysis of the JASPER Program. DOE shall provide to PNC all information associated with such planning, conduct and analysis promptly and in no case later than the publication or release of such information to any other country.

5. PNC shall assign specialists to work at ORNL, pursuant to the assignment of staff under Article V, for the duration of

the JASPER Program. No more than two assignments shall be in effect at any time. The PNC specialists shall participate in the planning and pre-analysis of the Experiments in the JASPER Program, assist in the conduct of the Experiments in the JASPER Program, and assist in the post-analysis of the Experiments in the JASPER Program.

ARTICLE III

Management

1. DOE and PNC shall each appoint a Coordinator to supervise the execution of the JASPER Program.
2. It is anticipated that during the JASPER Program two joint meetings between DOE and PNC specialists may be required to define requirements for the Experiments of the JASPER Program and to review the results of the Experiments of the JASPER Program. The dates and locations of any required meetings shall be recommended by the JASPER Coordinators for DOE and PNC approval.
3. The JASPER Program shall be under the purview of the Reactor Core Working Group of the DOE/PNC Joint Coordinating Committee on Cooperation in Liquid Metal Cooled Fast Breeder Reactor Development under the LMFBR Agreement.

ARTICLE IV

Finance

1. PNC shall make a cash contribution of \$1,500,000 to cover the cost of experiments and overhead.
2. The cash contribution shall be made in U.S. dollars in the following manner:
 - a. \$300,000 shall be due and payable upon receipt of an invoice to be issued upon or shortly after the date of signature of this Specific Memorandum of Agreement.
 - b. \$600,000 shall be due and payable upon receipt of an invoice to be issued after April 1, 1986.
 - c. \$600,000 shall be due and payable upon receipt of an invoice to be issued after April 1, 1987.
3. Budget planning and financial management of the JASPER Program shall be the responsibility of DOE.
4. PNC shall continue to share in the information derived from experiments over the life of the JASPER Program without any

obligation to contribute additional funds beyond those designated in paragraph 1 above.

5. Aside from the cash contribution by PNC under 1 above, each Party shall bear all costs of its own participation in the JASPER Program.

6. Participation in this Specific Memorandum of Agreement is subject to the availability of appropriated funds. If funding is provided under 2.a above but not under 2.b or 2.c above, then the JASPER Program shall be terminated in accordance with Article IX. In the event of such termination, DOE shall complete that part of the JASPER Program for which funds have been made available, and shall provide to PNC all information obtained from this work.

ARTICLE V

General Provisions

Article 8, 11, 13, and 14 of the LMFBR Agreement are hereby incorporated by reference.

ARTICLE VI

Information

1. The Parties shall support the wide dissemination of information provided, exchanged or arising under this Specific Memorandum of Agreement, subject to the provisions of Article VII. Information may be made available to the public by either Party through its customary channels and in accordance with its normal procedures.

2. Proprietary information shall not be accepted for or utilized in the JASPER Program without the express written approval of DOE. For the purposes of this Specific Memorandum of Agreement, proprietary information means information which contains trade secrets or commercial or financial information which is privileged or confidential, and may only include such information which:

- a) has been held in confidence by its owner;
- b) is of a type which is customarily held in confidence by its owner;
- c) has not been transmitted by the transmitting Party to other entities (including the receiving Party) except on the basis that it is to be held in confidence; and

- d) is not otherwise available to the receiving Party from another source without restriction on its further dissemination.

It shall be the responsibility of the Party supplying proprietary information to identify the information as such and to ensure that it is appropriately marked.

3. Information transmitted by one Party to the other Party under this Specific Memorandum of Agreement shall be accurate to the best knowledge and belief of the transmitting Party, but the transmitting Party does not warrant the suitability of the information transmitted for any particular use or application by the receiving Party or by any third Party. Information developed jointly by the Parties shall be accurate to the best knowledge and belief of both Parties. Neither Party warrants the accuracy of the jointly developed information or its suitability for any particular use or application by either Party or by any third Party.

ARTICLE VII

Patents

1. Any invention or discovery made or conceived in the course of or under the JASPER Program under this Specific Memorandum of Agreement (hereinafter referred to as "arising inventions") shall be identified and reported promptly by DOE to PNC. Information regarding inventions on which patent protection is to be obtained shall not be published or publicly disclosed by the Parties until a patent application has been filed in either country of the Parties, provided, however, that this restriction on publication or disclosure shall not extend beyond six months from the date of reporting of the invention. It shall be the responsibility of DOE to appropriately mark reports which disclose inventions that have not been appropriately protected by the filing of a patent application.

2. Arising inventions shall be owned (1) by PNC in Japan, subject to a royalty-free, nonexclusive, irrevocable license to DOE, its Government, and its nationals of its country designated by it and (2) by DOE in the United States and third countries, subject to a royalty-free, nonexclusive, irrevocable license to PNC, its Government, and the nationals of its country designated by it.

3. This Article shall apply mutatis mutandis to the protection of utility model and of design.

4. Each Party shall, without prejudice to any rights of inventors or authors under its national laws, take all necessary steps to provide the cooperation from its inventors or authors required to carry out the provisions of this

Article, Article VI, and Article VIII. Each Party shall assume the responsibility to pay awards and compensation required to be paid to its own nationals according to its own laws.

ARTICLE VIII

The Parties recognize the role of utilities and industry in the development on shielding design approaches. Representatives from prime or sub-contractors may be invited to participate in discussions and meetings. The Parties are responsible for ensuring that such invited participants shall follow the provisions of this Specific Memorandum of Agreement concerning the handling of information and inventions or discoveries.

ARTICLE IX

Duration and Amendment

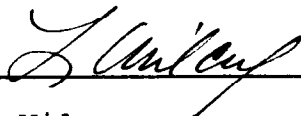
1. This Specific Memorandum of Agreement shall enter into force upon signature for a four-year period. This shall include a three-year experimental program and a contingency of one year for final reporting. This Specific Memorandum of Agreement may be extended by mutual written consent.
2. All activities not completed at the expiration of this Specific Memorandum of Agreement may be continued until their completion under the terms of this Specific Memorandum of Agreement.
3. This Specific Memorandum of Agreement may be terminated at any time at the discretion of either Party upon six months advance notification in writing by the Party seeking to terminate this Specific Memorandum of Agreement. Such termination shall be without prejudice to the rights that may have accrued under this Specific Memorandum of Agreement to either Party up to the date of the termination.

Done at TOKYO, JAPAN this day of 26th September, 1985

FOR THE UNITED STATES
DEPARTMENT OF ENERGY

FOR THE POWER REACTOR
AND NUCLEAR FUEL
DEVELOPMENT CORPORATION
OF JAPAN

SIGNATURE



NAME: L. Wilcox

TITLE: Deputy Assistant Secretary

SIGNATURE:



NAME: G. Nagane

TITLE: Vice President